OAKLAND COUNTY
CLINTON RIVER WRRF
IMPROVEMENTS
(FORMERLY PONTIAC WWTP)

CHAPTER 20 DRAINAGE DISTRICT
OFF-ROADING PROCESS MAP

- Execution of a project through alternative methods
- Municipal & Manufacturer partnering for product development
- Fine Screening technology & future based finer screening needs
Partnering with

OAKLAND COUNTY MICHIGAN

WATER RESOURCES COMMISSIONER
Jim Nash

WEISS CONSTRUCTION CO., L.L.C.

DuBois-Cooper

Duperon ADAPTIVE TECHNOLOGY™
2015
WASTEWATER SYSTEM
Wastewater System

- **SERVICE**
  - CITY OF PONTIAC – 55,870 (POPULATION)
  - SYLVAN LAKE – 1,835
  - 30% OF THE COSDS - 125,038 (POPULATION)
    - APPROXIMATELY 70% OF THE 8 TRIBUTARY COMMUNITIES

- **PONTIAC WWTP ACTIVATED SLUDGE PLANT**
  - TREATMENT CAPACITY 30.5 MGD
  - PEAK FLOW RATE 41.3 MGD
  - AVERAGE FLOW OF 20 MGD

- **SOLIDS DISPOSAL**
  - AVERAGE DAY -15.6 DRY TONS
  - PEAK OF 26.5 DRY TONS
Asset Status

- Asset Status - 2016 – Over 45% of the asset exceeded useful life
- Operating Budget – $7,506,040
AUBURN SITE SOLIDS HANDLING

- Solids Processing Building
- Primary + Secondary Digester
- Biosolids Storage Pad
- Clinton River
EAST BOULEVARD – SITE/PROJECT HISTORY

- Existing plant is designed for a peak flow of 30.6 MGD
- Originally constructed in the 1920s with major upgrades in the 1950s, 60s and 70s.
EXISTING INFLUENT SCREENS FACILITY

- 6 MGD Avg Flow
- 12-18 MGD Peak Flow
- 72-inch Influent Sewer
- (1) Existing 1-inch opening screen
- (1) Existing manual bypass screen
UPSTREAM PROCESS

• Upstream coarse screen
• 3-inch openings
EXISTING INFLUENT SCREENS FACILITY

• (1) Existing Chain & Rake Screen

• 1” Openings

• Past useful life

• Dual wheel barrel for screenings

• Manual disposal of screenings
EXISTING INFLUENT SCREENS FACILITY

- Worn components
- Consistent failures and regularly needed corrective maintenance
DESIGN A SUSTAINABLE SOLUTION TO SCREENINGS REMOVAL AND DISPOSAL

(1) Mechanical Bar Screen - Link Driven, Front Cleaning, Front Return

- FlexRake® Model – FPFS-M, SSTL304
- 1 ft head differential
- **Optional Bar Openings:**
  - 1/8 inch clear opening *(Beta)*
  - 1/4” inch clear opening
  - 20 degrees from vertical
- Channel Dimensions:
  - 5.50 ft wide x 7.30 ft channel height

(1) Washer Compactor - Dual Auger System, 304SS
FLEXRAKE® FPFS-M
Full Penetration Fine Screen - Millennial™ Platform

Ideal for:

• Vertical and Near-Vertical Wastewater Applications

• Retrofits with Channel Constraints

• Sites where Future Screening Options May be Required
Washer Compactor

Positive Displacement Dual-Auger System – Millennial™ Platform

- Reduces Landfill Costs
- Consistent Compaction Regardless of Debris Size or Volume
- Accepts Non-Standard Wastewater Debris (Rocks, Clothing, Concrete, Metal) up to 4 inches
- Positive Displacement—What Goes In, Comes Out
Product Development Cycle

- Purchase of Equipment
- Special Terms
- Testing Period

- Product Upgrades following test period
- Partnership with Owner
Oakland County Pilot Project Offering

Phase I – Design & Installation of Equipment

Phase II – 6 Month Research & Development Testing Period
  • Owner Option: Retain equipment as furnished and installed or request the screen be modified to ¼-inch openings at no additional cost.

Special Payment Terms – payment upon completion of each Phase

Warranty commencement after 6-month R&D period

Five Year Warranty for Wastewater Applications
Owner Benefits/Assessment

Benefits of the pilot for Oakland County:

- Greater screenings removal if 1/8” worked
- 39% Overall Est. Savings vs. traditional capital project
- Non-traditional project management
- New product trial and error
Hydraulics

• Comparable Flowable/Open Area
  • $10 \text{ MGD} = 1.84 \text{ in headloss through both } \frac{1}{4''} \text{ and } \frac{1}{8''} \text{ opening FlexRakes®}$

• Time to Blind = Differential Level Control & Operations

• All flow through (1) channel/screen
Debris Capture

- “Piloting” Washer Compactor capacity rules for application
- Sizing downstream equipment for increased screenings

*Based on ¼” Bar Slots

A
- Bar screens 5’ to 10’ wide
- Flows up to 25 MGD

B
- Bar screens 5’ to 10’ wide
- Flows up to 110 MGD

C
- Bar screens 5’ to 10’ wide
- Flows Up to 190 MGD
Debris Capture Results

- Field testing: 37% more than screenings than a ¼” opening, 17% more than MOP8 estimate
EAST BOULEVARD IMPROVEMENTS
Project Partnerships

Design-Build Concept

- Oakland County issued two separate contracts:
  - Duperon
  - Weiss

- On-site preliminary submittal review included all parties and a walk down on the site

- Collaborative approach to identify each party’s responsibilities and scope of work
Project Schedule & Path

- Executed Agreement: 6/10/15
- 1st Design Submittal: 7/2/15
- On-Site Design Review Meeting: 7/8/15
- Final Approval & Release to Manufacturing: 9/28/15
- Equipment Installation: 12/15/15
- Official Startup: 2/24/16
- Completion Of Testing: 8/24/16
Manufacturing & Factory Testing

September – December (12 weeks)

- 8 weeks fabrication & assembly
- 4 weeks factory testing
- Led by Product Owner to review and sign off each step of design, fabrication, assembly, testing & QC
- Owner Witness Testing option
Installation & Startup

December - February (8 weeks)

• Shipment 12/14/15

• Installed upon arrival with Weiss

• Dry testing and manual operation for interim testing

• Official startup and training kicked off 6-month testing period
EAST BOULEVARD IMPROVEMENTS

BEFORE

AFTER
6-Month Testing Period
February – August

Weekly Reporting:
- Average Daily Flow
- Operation Mode
- Debris Conditions
- Proper Tracking
- Noises
- Controls Faults

FMEA Testing & Logs Generated

Site Inspections

Product Improvements
Post Testing Period - Breakdown

- Consider Inspection Duration
- Have a back up plan in place at the beginning of the project. R&D requires extended time to understand failure modes
- Create a Communication Plan
Lessons Learned & Results

• Clear expectation of each party’s role in the project, specifically for transition into turnover of the operations to the County:
  • Maintenance
  • Operations
  • Warranty

• Communication Plan

• SCADA is helpful

• Prepare staff for change in routine
Thank You